

Small Bodies Missions

Deep Impact joins a suite of missions that will travel to other comets and asteroids and learn more about our solar system.

[Ephemerides for each of the following missions](#)

Comet Missions

STARDUST

Launch Date: 7 February 1999

Destination: Comet Wild 2

Encounter: January 2004

Sample Return: 2006

Objective: Collect comet dust and interstellar dust particles for return to earth

Description: This was the first mission to collect samples from a comet and return them to earth. Stardust made three loops around the sun before its closest approach to the comet. Samples were captured in a special material called aerogel and the collector retracted into a sample return capsule. The capsule was returned to earth during a soft landing at the U.S. Air Force's Utah Test and Training Range.

Web site: <http://stardust.jpl.nasa.gov>

CONTOUR

Launch Date: 3 July 2002

Contact Lost: 15 August 2002

NOTE: *Contact with the CONTOUR spacecraft was lost after an engine burn that was intended to send it out of Earth orbit. Evidence suggests the spacecraft split into several pieces and so far all efforts to make contact with CONTOUR have failed. The last attempt to contact the spacecraft was December 20, 2002 without a signal from the spacecraft. No further contact with the silent probe will be made.*

Objective: Encounter and study at least two comets by taking high-resolution pictures

Description: The Comet Nucleus Tour (CONTOUR) was scheduled to encounter at least two comets during their visit to the inner solar system. The spacecraft was to encounter each comet during its peak of activity close to the sun and take high-resolution pictures. The spacecraft was to rendezvous Comet Encke on Nov. 12, 2003 and Comet Schwassmann-Wachmann 3 on June 18, 2006.

ROSETTA

Launch Date: 2 March 2004

Destination: 67P/Churyumov-Gerasimenko

Encounter: 2014

Objective: Travel to and land upon the surface of the comet to study its nucleus.

Description: The International Rosetta Mission was approved in November 1993 by ESA's Science Programme Committee as the Planetary Cornerstone Mission in ESA's long-term space science programme. The mission goal was initially set for a rendezvous with comet 46 P/Wirtanen. After its launch postponement it will now aim at Comet 67P/Churyumov-Gerasimenko. On its 10 year journey to the comet, the spacecraft will pass by at least one asteroid. This mission is designed and managed by the European Space Agency (ESA).

Web site: <http://sci.esa.int/rosetta>

NEAR SHOEMAKER

Launch Date: 17 February 1996

Destination: Asteroid Eros

Encounter: 14 February 2000

Objective: Orbit asteroid Eros for a period of one year

Description: The NEAR spacecraft entered the orbit around Eros in February of 2000 to determine its

structure, geology, mass, composition, gravity and magnetic field. Having successfully completed its mission objectives, the project team took on an extended objective to land the spacecraft on the surface of Eros. The Near spacecraft touched down on February 12, 2001 transmitting 69 close-up images as it descended.

Web site: <http://near.jhuapl.edu>

DEEP SPACE 1

Launch Date: 24 October 1998

Destination: Comet Braille, Comet 19P/Borelly

Encounter: July 1999, September 2001

Objective: Test new technologies in space to fly by a comet

Description: The thorough testing of new technologies meant flying them on missions with a strong resemblance to missions of the future. The DS1 mission has successfully tested 12 new technologies in space including:

- An ion drive rocket engine
- A new solar panel design that concentrates sunlight
- An autonomous navigation system that guides the spacecraft using established positions of asteroids

On its way to Comet Borelly, the DS1 spacecraft flew past asteroid (9969) Braille in July 1999.

Web site: <http://nmp.jpl.nasa.gov/ds1>

DEEP IMPACT

Launch Date: 12 January 2005

Destination: Comet Tempel 1

Encounter: 4 July 2005

Objective: Impact the surface of a comet with a 370 kg impactor creating a crater that exposes fresh material from the interior, study crater formation and composition of the interior.

Description: Deep Impact was the first mission to look beneath the surface of a comet by making a crater that exposed fresh material from its interior and observing the chemistry of materials beneath. The dual spacecraft mission collected images and spectra of the impact and its aftermath from the impactor, the flyby spacecraft and from ground and space based observatories. The flyby spacecraft had approximately 14 minutes to observe before the comet passed over it. After turning, the spacecraft observed the comet for another 24 hours.

Web site: <http://deepimpact.jpl.nasa.gov>

Asteroid Missions

DAWN

Launch Date: June 2007

Destination: Vesta & Ceres

Encounter: Vesta July 2010 - July 2011, Ceres Aug 2014 - July 2015

Objective: Orbit two of the largest asteroids in the asteroid belt

Description: Dawn will orbit Ceres and Vesta, two of the largest asteroids in the asteroid belt, for 11 months each in order to characterize the conditions and processes of the solar system's earliest epoch. The top level question that the mission addresses is the role of size and water in determining the evolution of the planets. Ceres and Vesta are the right two bodies with which to address this question, as they are the most massive of the protoplanets, baby planets whose growth was interrupted by the formation of Jupiter.

Web site: <http://dawn.jpl.nasa.gov/>

Hayabusa

Launch Date: 9 May 2003

Destination: Asteroid 1998 SF36

Encounter: September 2005

Sample Return: June 2007

Objective: Collect up to three asteroid surface samples for return to Earth

Description: Hayabusa will arrive at asteroid 1998 SF36 and collect up to three surface samples before returning them to earth. The Japanese Institute for Space and Astronautical Sciences (ISAS) is managing the mission with some technical assistance provided by NASA.

Web site: <http://www.isas.ac.jp/e/enterp/missions/hayabusa/index.shtml>

[Ephemeris for Tempel 1](#)